

NOTES ON *HIBBERTIA*\*  
I. NEW TAXA FROM SOUTH-EASTERN AUSTRALIA

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Abstract

The new combination *Hibbertia incana* (Lindley) Toelken is made. The following taxa are described and illustrated, their affinities discussed and distribution outlined: *H. cistiflora* N.A. Wakef. subsp. *rostrata* Toelken, *H. humifusa* F. Muell. subsp. *debilis* Toelken and subsp. *erigens* Toelken, *H. obtusibractea* Toelken, *H. pallidiflora* Toelken, *H. sessiliflora* Toelken, *H. tenuis* Toelken & R. Bates, *H. torulosa* Toelken.

The compilation of *Hibbertia* for the Flora of Victoria has prompted a reassessment of a number of taxa. Only a few could be adequately evaluated in the limited time available to publish new taxa. Other known variants need much more field work to assess their full variation and taxonomic status. It is hoped that the publication of these taxa will encourage more discriminate collecting in this complex genus where species are known to consist of often numerous disjunct populations comprising local variants of the taxon more or less isolated variants. The revisor cannot possibly hope to explore the full distribution range of each species but equally cannot assess the taxonomy without knowledge of that range of variation. Consequently a full re-evaluation cannot be attempted at present of larger species complexes, such as *H. riparia*, throughout their wide range of much of temperate south-eastern Australia. Species from Victoria are particularly difficult to evaluate because most of at least the older names are based on specimens collected in central New South Wales, Tasmania or South Australia, so that one is rarely dealing with the typical form, and, if so, then it is often one of several forms in Victoria.

Three rare species endemic to South Australia are also described because here as in Victoria their conservation may depend on taxonomic recognition. More research time has been given to their discrimination to help their conservation.

Without entering into detailed discussions of the inflorescences found in *Hibbertia* only one foliage organ immediately below the terminal flower is always called a 'bract'. Rarely few similar bracts are found next to one another. Other leaves lower down which might be modified to enhance the inflorescence, such as the often very much broadened leaves below the inflorescence of *H. incana* are then referred to as 'bract-like leaves' as opposed to 'leaf-like bracts', which are relatively large bracts that are similar to foliage leaves.

The terms 'central vein' and 'central ridge' for a structure at a similar position on the abaxial leaf surface are not used interchangeably. The latter is used for a much enlarged structure incorporating the relatively small vein being only a small part of it. In this way structural information is reflected in the terminology. The central ridge and/or the revolute margins are often unequally swollen so that their relative level to one another was found to present a reliable characteristic of many taxa when taken at the middle of mature cauline leaves.

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\* This paper is dedicated to Dr R.D. Hoogland for his contribution to a better understanding of the complex taxonomy of *Hibbertia*.

**Hibbertia cistiflora** N.A. Wakef., Victorian Naturalist 72: 119 (1955).

*Pleurandra cistiflora* Sieber ex Spreng., Syst. Veg. 4, Curae Posteriores 191 (1827), nom. illeg., non Rchb. (1825).

*Type:* Australia, *F.W. Sieber* in Sieber's 'Flora Novae Hollandiae No. 148' (holo.: B n.v. but probably destroyed; iso.: G, MEL).

Hoogland (1983) has already pointed out that Wakefield's name for the species must be treated as a *nomen novum* because it is based on the illegitimate name, *Pleurandra cistiflora* Sieber ex Spreng. (cf. Art. 58, Greuter et al. 1994).

This species is distinguished from all other similar members of the *H. riparia* complex by the hairs, if present, usually being simple, and the glabrous carpels each with the style attached to the dorsal side and not the apex as in the latter species.

**Key to subspecies**

- 1. Leaves with apex obtuse to acute, usually somewhat recurved, with central ridge raised above narrow revolute margins, covered with tubercle bases (or with hairs when young) mainly along the margins ..... 1a. subsp. *cistiflora*
- 1: Leaves with apex drawn into blunt beak, stiffly erect, with central ridge recessed or rarely at the same level as revolute margins and with tubercle bases (without hairs) on most parts of leaves ..... 1b. subsp. *rostrata*

**1a. subsp. *cistiflora*.**

Spreading to decumbent shrublets, with glabrous, usually wiry branches to 0.4 m long. *Tomentum* of tubercle-based hairs each with rarely more than 1 branch but wearing off soon, mainly on leaves. *Leaves: lamina* linear to linear-lanceolate (1.7-) 2.5-5 (-8.6) × (0.4-) 0.5-0.8 (-1.1) mm, obtuse often becoming rounded, with central ridge scarcely protruding beyond the apex and recurved when young, above with scattered simple hairs or their tubercle bases mainly along the margin, below with broad central ridge raised high and protruding beyond the revolute margins and usually without hairs or tubercle bases. *Flowers* sessile, terminal on some branches but not on short shoots.

*Distribution and ecology*

Growing in heath or woodland often associated with sandstone outcrops in central New South Wales (CC, CT).

*Voucher specimens*

NEW SOUTH WALES: *Central Tablelands: E.F. Constable NSW 43105* (CANB, NSW); *R.D. Hoogland 12256* (CANB; HBG, K, L, NSW, UC n.v.).

**1b. subsp. *rostrata* Toelken, *subsp. nov.***

A subsp. *cistiflora* foliorum apicibus extensis in rostris et dorsis centralibus recessis differt.

*Type:* Victoria, The Grampians, Victoria Range, c. 3 miles S of Goat Track, *R.D. Hoogland 11889*, 20.ix.1970 (holo.: CANB; iso.: MEL, NSW; B, HBG, K, L, UC, US n.v.)

Spreading to scrambling shrubs 0.2-0.6 (-1.5) m tall, with glabrous, woody to rarely wiry branches when scrambling. *Tomentum* papillose representing tubercle bases of hairs that are only visible on the beak of young leaves. *Leaves: lamina* linear, (4-) 6-12 (-14.5) × 0.5-1 (-1.2) mm, tapering into a beak (0.1-) 0.2-0.5 mm long (straight or curved upwards when



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Fig. 1. A-C, *Hibbertia cistiflora* subsp. *rostrata*. A, flowering branch; B, cauline leaf from below; C, transverse section at middle of cauline leaf (R.D. Hoogland 11896). D, *H. humifusa* subsp. *humifusa*, flowering branch (H.R. Toelken 8362). E, - subsp. *erigens*, flowering branch (R. Thomas 583). F, - subsp. *debilis*, flowering branch (A.C. Beaglehole 38020). G-I, *H. incana*. G, flowering branch; H, cauline leaf from below; I, transverse section at middle of cauline leaf (Ackland 12). K, L, *H. sericea* var. *sericea*. K, cauline leaf from below; L, transverse section at middle of cauline leaf (Cowle MEL 35676).

young) and formed by the protruding central ridge, with scattered tubercle bases on both surfaces, below with narrow revolute margins raised and protruding beyond the recessed broad central ridge. *Flowers* sessile, terminal mainly on short shoots with up to 8 reduced leaves. Fig. 1A–C.

#### *Distribution and ecology*

Found in heath or scrub vegetation, rarely in rock outcrops at high altitude and usually well above the forested areas of the Grampians, Victoria.

#### *Voucher specimen*

VICTORIA: *Grampians*: R.D. Hoogland 11893 (CANB, MEL; BRI, HBG, L, UC n.v.).

#### *Notes*

In very exposed situations the plants are usually rigid spreading shrubs to 25 cm high with most flowers terminal on branches. Mainly when plants are scrambling in other vegetation the branches are more wiry with many apparently axillary flowers sessile on short shoots along the elongated branches. In both growth forms the leaves of this subspecies are found along the branches in contrast to the typical subspecies, where they are often clustered at the end of each branch. However, occasionally the leaves are also clustered towards the end of branches in subsp. *rostrata* in plants growing under what seem to be exposed conditions.

The epithet 'rostrata', beaked in Latin, refers to the beaked leaves.

*Hibbertia humifusa* F. Muell., Pl. Victoria 1: 16, suppl. t.1 (1862).

*Type*: Victoria, 'in barren shrubby plains near Mount Zero', Nov. 1853, F. Mueller MEL 1010248 (lecto.: MEL, selected here; syn: MEL 1010247, MEL 1010249, MEL 1010250).

Perennials with prostrate to decumbent branches up to 0.4 m long, usually much branched, with pubescent to glabrescent wiry branches. *Tomentum* of tubercle-based stellate hairs (rarely locally absent) under simple hairs on branches, leaves and sepals. *Leaves* with axillary tuft of hairs 0.3–1.2 mm long; *petiole* often indistinct, 0.2–0.6 mm long; *lamina* linear-elliptic rarely -lanceolate, (3.5-) 5.4–9 (-14) × 0.9–3 mm, gradually constricted into blunt rarely acute apex with a tuft of more or less well developed simple hairs and into short petiole, above convex and pubescent often becoming glabrous, below with narrow recurved margins scarcely raised above narrow central vein on exposed undersurface usually stellate-tomentose together with more or less simple hairs. *Flowers* with peduncle 0–24 mm long and turning downwards after flowering, terminal on main shoots or rarely on short shoots, with one rarely two bracts 2.2–3.7 mm long and borne in different positions varying from the base of the peduncle to below the flowers. *Sepals* 3.3–9.4 mm long but enlarging after flowering, acute to acuminate, outside more or less densely covered with stellate hairs under usually coarse, few to many simple hairs, inside usually pubescent with stellate and/or simple hairs. *Petals* obovate to oblanceolate, 5.8–12.4 mm long, bright yellow. *Stamens* 6–10 in one cluster; *filaments* usually free; *anthers* oblong, truncate above and below. *Carpels* 2, tomentose, each recurved with style attached to the upper third of dorsal apex.

#### *Notes*

This variable species is fully described here because it is no longer construed in a narrow sense as the typical subspecies. The range of variation observed in the limited material of subsp. *humifusa* from the Grampians represents that of isolated populations of a more

widespread species fragmented by its specific habitat requirements, so that the other two subspecies recognised here are seen as extreme forms presumably isolated for a long period of time from the geographically central population. The type from near Mt Zero (northern Grampians) is much closer to subsp. *erigens* and subsp. *debilis* in its sparser tomentum, and the smaller flowers borne usually on longer peduncles, than populations from near Stawell (mid-eastern Grampians). It would be desirable to relocate plants of this population in order to evaluate how closely its range of variation would resemble that of the geographically isolated subspecies. All attempts to do this have failed. It is, however, significant that plants from the isolated populations of subsp. *humifusa* from near Heathcote are almost indistinguishable from those from near Stawell.

### Key to subspecies

1. Outer sepals 3.5–5.8 mm wide ..... 1a. subsp. *humifusa*  
 1: Outer sepals 1.3–3 mm wide:  
 2. Sepals 4.2–7.5 mm long; stellate hairs scattered on branches ..... 1b. subsp. *erigens*  
 2: Sepals to 3.6 mm long when flowering; stellate hairs usually absent from branches..... 1c. subsp. *debilis*

#### 1a. subsp. *humifusa*.

Perennial with prostrate branches to 0.4 m long and with stellate and simple hairs. *Peduncle* 0.5–8 mm long when flowering, stiff, with single bract borne usually on upper half. *Outer sepals* ovate, 5.2–7.8 mm long, 3.5–5.8 mm wide, densely covered with stellate and coarse simple hairs. Fig 1D.

#### *Distribution and ecology*

Growing usually on sandy to sandy-clay soil but often near temporary moist places and usually associated with woodland, mainly on lower slopes of and the plains surrounding the Grampians, but has also been recorded from near Heathcote.

#### *Voucher specimens*

VICTORIA: *Grampians*: A.C. Beaglehole 49799 (CANB, MEL); *Midlands*: A.C. Beaglehole 64997 (MEL).

#### 1b. subsp. *erigens* Toelken, *subsp. nov.*

A *H. humifusa* subsp. *humifusa* sepalis exterioribus angustioribus pilis simplicibus paucis et saepe pedunculis longioribus; a subsp. *debili* sepalis exterioribus longioribus et latioribus et saepe pedunculis longioribus differt.

*Type*: Victoria, Western Interchange, Euroa, *R. Thomas A*, 5.x.1992 (holo.: AD; iso.: K, MEL).

Perennial with decumbent branches to 0.25 m long and with stellate and simple hairs. *Peduncle* 4–25 mm long when flowering, thread-like, with single bract borne on lower third. *Outer sepals* lanceolate, 4.2–7.5 mm long, 1.9–3 mm wide, covered sparsely to densely with stellate hairs under scattered simple hairs. Fig. 1E.

#### *Distribution and ecology*

Growing on sandy loam in open vegetation often associated with woodland of *Eucalyptus blakelyi*, *E. macrorhyncha*, *E. melliodora* and *E. microcarpa* of central Victoria.

#### *Voucher specimens*

VICTORIA: *Midlands*: *R. Thomas 583* (MEL); *Riverina*: *D.G. Cameron s.n* (MEL).

*Notes*

The epithet 'erigens', rising in Latin, refers to the erect flowers on their slender peduncles which give them in the low grass of their habitat the impression of a rising star on the horizon.

1c. subsp. *debilis* Toelken, *subsp. nov.*

A *H. humifusa* subsp. *humifusa* sepalis exterioribus brevioribus angustioribusque et pilis stellatis paucis in ramis; a subsp. *erigenti* sepalis exterioribus brevioribus et angustioribusque et pedunculis brevioribus differt.

*Type:* Victoria, near Dergholm, A.C. Beauglehole 38020, 7.12.1971 (holo.: MEL; iso.: CANB, HO).

Perennial with decumbent branches to 0.2 m long with simple or rarely stellate hairs below flowers. *Peduncle* 4–7 mm long when flowering, thread-like, with 1 or 2 bracts borne at the base or lower third of the peduncle. *Outer sepals* lanceolate, 3.3–3.6 mm long, 1.3–1.5 mm wide, sparsely covered with stellate hairs under scattered simple hairs. Fig. 1F.

*Distribution and ecology*

Known only from the type collection from wet heathland near Dergholm and urgently in need of conservation.

*Notes*

The subsp. *debilis* is the smallest of the three subspecies and hence the choice of the epithet 'debilis', delicate or weak in Latin.

*Hibbertia incana* (Lindley) Toelken, *comb. nov.*

*Pleurandra incana* Lindley in T. Mitch., Three Exped. Australia 2: 156 (1838).

*Type:* Victoria, Mt Hope, T.L. Mitchell 204, 28.vii.1836 (holo.: CGE n.v.; iso.: MEL).

*H. stricta* (R. Br. ex DC.) F. Muell. var. *canescens* Benth., Fl. Austr. 1: 27 (1863); J.M. Black, Fl. S. Austr. 2 edn, 3: 576 (1952); S.J. Forbes et al., Cens. Vasc. Pl. Vic. 48 (1984).

*Type:* as for *P. incana*.

*H. sericea* sensu Benth., Fl. Austr. 1: 26 (1863), pro parte; sensu Willis, Handb. Pl. Victoria 2: 390 (1972), pro parte; sensu Beadle, Stud. Fl. N.E. New South Wales 3: 255 (1976), pro parte; sensu Beadle et al., Fl. Sydney Region 3 edn, 228 (1982); sensu Jessop in Jessop & Toelken, Fl. S. Austr. 1: 357 (1986), pro parte; sensu Harden & J. Everett in Harden, Fl. New South Wales 1: 302 (1990), pro parte - non Benth., Fl. Austr. 1: 26 (1863).

Spreading shrubs 0.2–1.5 (-2) m tall, often much branched. *Tomentum* of fine tubercle-based hairs consisting of dense stellate hairs each with 2 to many branches and above them more or less dense long silky hairs, on branches, leaves and sepals. *Leaves* with axillary tuft of hairs 0–1.2 (-1.8) mm long; *petiole* indistinct, 0–0.6 mm long; *lamina* of cauline leaves linear to linear-triangular or rarely linear-elliptic, (3.2-) 5.2–13.5 (-22.4) × (1.2-) 1.7–2.5 (-4) mm, obtuse or rounded with pointed to rounded apex of central ridge touching but rarely protruding beyond apex, abruptly constricted into petiole, above convex and stellate-tomentose appearing velvety under usually long silky hairs which soon wear off, below with central ridge usually much broader than but often not touching revolute margins and stellate-tomentose like above. *Flowers* sessile, in terminal clusters of 1–7 (-12) flowers by sympodial growth on main branches and usually more or less surrounded by broadened

bract-like leaves and subtended by smaller leaf-like bracts 3.4–8.2 mm long and with recurved margins. *Sepals*: outer ones oblong-lanceolate, obtuse with recurved margins at least at the apex, 5.3–11.1 mm long, tomentose outside and usually about two-thirds of inside; inner ones oblong ovate, rounded to cuspidate and with more or less membranous margins, 4.8–8.4 mm long, tomentose outside and sometimes the margins inside, pale green. *Petals* usually broadly obovate, 5.4–13.6 (–15.3) mm long, bright yellow. *Stamens* (8–) 10–14 (–16) in one cluster; *filaments* free or basally connate; *anthers* oblong, truncate at apex and base. *Carpels* 2, short-velvety to woolly, recurved with erect styles attached to dorsal apex. Fig. 1H–G.

#### *Distribution and ecology*

Recorded from a wide range of vegetation including scrub, woodland and forest but often associated with granite outcrops. Known from New South Wales (CT, ST, CWS, SWS, SWP), south-eastern, central to mainly western Victoria and eastern South Australia (FR, EA, NL, MU, SL, KI, SE).

#### *Voucher specimens*

SOUTH AUSTRALIA: *Flinders Ranges*: A.S. Weston 1667 (AD); *Southern Lofty*: H. Eichler 16299 (AD); *South-eastern*: L.D. Williams 12418 (AD). VICTORIA: *East Gippsland*: A.C. Beaglehole 33931 (MEL); *Eastern Highlands*: A.C. Beaglehole 77886 (MEL). NEW SOUTH WALES: *North Western Plains*: R.D. Hoogland 12295 (NSW; A, BRI, K, L, MEL, P n.v.)

#### *Notes*

*H. incana* has never received full recognition. There is no evidence that Bentham (1863) saw a type of it when he used the species as the basis for his *H. stricta* var. *canescens*. It would seem that he based his decision on two specimens from Balmy Creek, south-eastern Queensland (*T.L. Mitchell* 524, 579 - K), which do indeed belong in the *H. riparia* complex which includes *H. stricta*. *H. incana* belongs in the *H. sericea* complex because of its long axillary hairs and hairs between the petals and stamens. Bentham's placing of *H. incana* then explains why he identified some specimens of this species as *H. sericea* in a wider sense and published the combination in *Hibbertia*. The synonymy cannot be clearly assessed because it is usually difficult to evaluate which specimens were seen by various authors.

*H. incana* shares with *H. sericea* the presence of terminal clusters of flowers as well as the unusual character of tufts of hair between the stamens and the petals, a feature which distinguishes it from some similar forms of the *H. riparia* complex. The equally dense tomentum on both surfaces of the leaves and being composed of stellate hairs with usually a few scattered long simple hairs, the central ridge being continued to the apex of the cauline leaves, and the upper two-thirds of the outer sepals being covered on the inside with stellate hairs (cf. Fig. 1H–L) distinguish it from *H. sericea* var. *sericea* and var. *scabrifolia*, while var. *major* shares the latter two characters with it, but is mainly found on the Eyre and York Peninsulas where *H. incana* does not occur.

*H. incana* and *H. sericea* are very variable and the two species have usually been amalgamated as the variation of their characters seemed to overlap. For instance, in the northern Grampians a particularly hairy form is found resembling *H. incana* in that respect, but it must be identified as *H. sericea* because the central ridge of the cauline leaves does not extend up to their apex and also the outer sepals tend to be covered up to about half their inner surface with fine stellate hairs. The cauline leaves are also relatively broad-elliptic and the undersurface between the revolute margins and the central ridge is exposed unlike the usually tight linear or linear-triangular leaves of typical *H. incana*, which has also been recorded from parts of the Grampians (e.g. near Brim Springs, *H.R. Toelken* 8367). The possibility of hybridisation can therefore not be excluded. It will, however, be



Fig. 2. A-C, *Hibbertia obtusibracteata*. A, flowering branch; B, cauline leaf from below; C, transverse section at middle of cauline leaf (R. Bates 7651). D-I, *H. pallidiflora*. D, flowering branch; E, juvenile cauline leaf from below; F, transverse section of juvenile leaf; G, adult cauline leaf from below; H, transverse section of adult leaf; I, flower with one sepal and two petals removed (D-H, A.G. Spooner 10769; I, H.R. Toelken 8567). K-M, *H. sessiliflora*. K, flowering branch; L, cauline leaf from below; M, transverse section at middle of cauline leaf (H.R. Toelken 8358). N-O, *H. tenuis*. N, flowering branch; O, cauline leaf from below; P, transverse section at middle of cauline leaf (R. Bates 4051). Q-S, *H. torulosa*. Q, flowering branch; R, cauline leaf from below; S, transverse section at middle of cauline leaf (Clucas s.n., AD).



difficult to locate hybrid populations as much of the vegetation of the adjoining flats from where *H. incana* was mainly recorded has been disturbed. Hybrids have not been recorded from other localities where both species were found growing close to one another, e.g. Mary Seymour Conservation Park, *R. Bates* 11689, 11690. All indications are that these very hairy plants from parts of the Grampians are a form of the variable *H. sericea*.

Similar populations with larger cauline leaves with often exposed undersurface recorded from forested areas of the Mt Lofty Ranges must be identified as *H. incana*. Their cauline leaves are linear-triangular throughout, the central ridge extends visibly to the apex, and at least two-thirds of the inner surface of the outer sepals are covered with stellate hairs. Here a full range of intermediates has been recorded from large shrubs sometimes up to 2 m high and up to 2.5 m across to the commoner spreading shrubs usually less than 0.8 × 1.5 m. The shape and size of the whole plant and its individual organs vary greatly with environmental conditions, or whether it is a young vigorously growing plant as compared with a senescent one.

In distribution the two species also show slight overlap but for most of their distribution they are quite separate. While *H. sericea* occurs along much of the coastal areas of Victoria and southern South Australia as well as Tasmania, *H. incana* has essentially an inland distribution. In New South Wales *H. incana* occurs from the Central Tablelands mainly north of the mountain ranges associated with the Australian Alps, which it skirts, into central and eastern Victoria, but has most commonly been recorded from western Victoria, and generally eastern South Australia.

Two forms, each of which occurs over a large area, can commonly be recognised within this species. The form including the type specimen may or may not have long simple hairs mainly along the margins of cauline leaves and they are generally absent from the central ridge and, in particular, its base. Since these long hairs wear off easily this character is not always available but the tufts of hairs in the axils of leaves are 0–0.6 mm long in this form and 0.5–1.2 mm or rarely up to 1.8 mm below the inflorescences in the more widespread form. Both of these characters become unworkable in specimens of depauperate and senescent plants, so that no infraspecific taxa can be clearly delineated although the provenance of most of the material is obvious.

The hairs of *H. incana* are much finer (0.01–0.015 mm diam.) than those of *H. sericea* (0.025–0.04 mm diam.) and the former would have better deserved the name 'silky' (= *sericea*), but the holotype of *H. sericea* (G!) confirmed the present interpretation.

### ***H. obtusibracteata* Toelken, *sp. nov.***

*H. acicularis* sensu Jessop in Jessop & Toelken, Fl. S. Austr. 4 edn, 1: 354 (1986), non (Labill.) F. Muell.

A *H. aciculari* plantis omnibus glabris, bracteis obtusis ad basim pedunculi elongati, stylis affixis dorsaliter versus medium; a *H. rufa* plantis omnibus glabris, habito rigido effuso filisque discretis differt.

*Type:* Kangaroo Island, Branch Creek Road, *R. Bates* 7651, 2.xi.1986 (holo.: AD; iso.: CANB, G, K, MEL, MO).

Much-branched shrublets with glabrous spreading to decumbent branches 15–40 cm long. *Tomentum* absent except for fine tubercles sometimes on leaf surfaces. *Leaves* without axillary tufts of hairs; *petiole* 0.1–0.3 mm long; *lamina* linear to linear-lanceolate, (2-) 2.8–4.4 (-5.6) × 0.4–0.6 (-0.75) mm, pointed with deciduous terminal bristle on usually slightly incurved protruding central ridge, abruptly constricted into short petiole, above more or less convex, below with raised revolute margins touching broad recessed central ridge. *Flowers* on peduncle (2.5-) 4.4–19.5 mm long, terminal mainly on short shoots sometimes only with

a few reduced leaves followed by an obtuse to rounded bract 0.6–1.6 mm long and on the lower third of the peduncle. *Sepals* 3.4–4.8 mm long, outer linear-elliptic, obtuse to rounded and more or less tinged red, inner oblong-ovate to oblong, rounded and usually pale green tinged red towards the apex, glabrous. *Petals* obovate, 4.2–6.6 mm long, bright yellow. *Stamens* (4-) 6 (-7) in one cluster; *filaments* free or almost so; *anthers* oblong with cuneate base. *Carpels* 2, glabrous, with styles from mid-dorsal side. *Seeds* elongate comma-shaped, with membranous aril elongated downwards and a short sheath around the attachment of the seed. Fig. 2A–C.

#### *Distribution and ecology*

Growing on laterite or often on ironstone in scrub vegetation or mallee heath on Kangaroo Island.

#### *Voucher specimens*

SOUTH AUSTRALIA: *Kangaroo Island*: G. Jackson 1498 (AD); B.M. Overton 273 (AD).

#### *Notes*

*H. obtusibracteata* combines many characteristics of *H. acicularis* and *H. rufa*. Its more rigid habit of spreading much-branched stems with short internodes and spreading bristle-tipped leaves as well as free filaments resemble *H. acicularis*, but it differs by the shorter and softer leaves, the obtuse bracts together with two or three reduced leaves at the base of the usually red peduncle, and the mid-dorsal attachment of the styles to the ovary. The latter are all characters found in *H. rufa* which differs in addition to the above characters from *H. acicularis* by the presence of some hairs on at least young branches and leaves as well as in the axils of leaves, and typically the apex of young leaves are crowned by a tuft of short hairs or rarely almost papillae. The name is derived from the obtuse bracts found in this species.

#### *Hibbertia pallidiflora* Toelken, *sp. nov.*

A *H. aspera*, *H. cinerea* et *H. empetrifolia* floribus recurvis petalis tubularibus quam sepalis brevioribus, staminibus quam stylis rectis multo brevioribus et antheris appendiculatis differt.

*Type*: South Australia, southern York Peninsula, along Hillock Road, H.R. Toelken 8567, 2.x.1994 (holo.: AD; iso.: B, CANB, G, K, MEL, MO, NSW, NY, S).

Usually dense shrublets with flexible branches often scrambling to 1.5 m rarely up to 4 m high, pubescent to puberulous. *Tomentum* of tubercle-based mainly stellate hairs of different sizes with usually many branches, on branches, leaves and calyx, but juvenile leaves mainly with simple hooked hairs on the undersurface. *Leaves* without axillary tuft of hairs; *petiole* 0.2–0.9 (-1.6) mm long; *lamina* obovate to oblanceolate, (1.8-) 2.3–10.4 (-13.1) × 0.9–6.5 (-7.2) mm, rounded to rarely obtuse with apex of central vein bulging and covered with stellate hairs, more or less abruptly tapering into petiole, usually flat, above pubescent, rarely puberulous or tomentose, below pubescent to tomentose or on juvenile leaves puberulous with mainly simple hooked hairs between the recurved margins and central vein with mainly stellate hairs. *Flowers* on peduncle (0.8-) 2.2–9.5 (-17.3) mm long, terminal on all branches or leaf-opposing when overtopped by growth from axillary buds, with linear bract 1.2–2.2 mm long, subtending calyx. *Sepals* 2.1–3.9 mm long, outer ovate and acuminate, inner oblong-ovate and rounded or obtuse, pubescent, pale green. *Petals* oblong-obovate to almost orbicular, entire to more or less bilobed, 1.3–2.5 mm long, cream to pale yellow turning rusty-orange when dry. *Stamens* 8–13 in one cluster; *filaments* basally connate; *anthers* oblong, apiculate. *Carpels* 2, pubescent, with erect styles from the apex. Fig. 2D–I.

*Distribution and ecology*

Growing usually in moist sandy soils sometimes close to temporarily flooded areas or often associated with surface limestone in scrub vegetation close to the coast and associated with mallee, particularly *Eucalyptus diversifolia*; in South Australia recorded from the southern Yorke and Fleurieu Peninsulas, Kangaroo Island and scattered through mainly the coastal areas of the South-East. Its distribution has been poorly recorded, which in part at least may be attributed to its elusive flowers. It is protected in several conservation parks.

*Voucher specimens*

SOUTH AUSTRALIA: *Yorke Peninsula*: A.G. Spooner 10769 (AD); *Southern Lofty*: R. Bates 9487 (AD); *Kangaroo Island*: P. Martensz 276 (AD, CANB, K, MEL, L); *South-eastern*: P. Gibbons 600 (AD).

*Notes*

R. Bates first drew my attention to the tubular corolla which is usually not obvious in dried material. It is now clear from investigations in the field that this is part of a pollination syndrome unique in the genus. The small flowers are curved downwards so that the petals are not visible from above. The pale yellow petals open to form a cylindrical tube around the erect styles with the stigmas just below its opening, and the small stamens close to the ovary. The stigmas are therefore not situated below the apex of the anthers as in *H. aspera*, *H. cinerea* and *H. empetrifolia*.

The flexible branches scramble up shrubs or trees often up to 1.5 m high, but Bates 7620 records them up to 4 m high in trees in Flinders Chase National Park, Kangaroo Island.

The tomentum of the leaves of this species is also unusual in that it is at first similar to that of *H. empetrifolia* with hooked hairs on the undersurface, but then develops in a short transition zone to mainly stellate hairs resulting in stellate-pubescent to -tomentose leaves similar to *H. aspera* and *H. cinerea*. In the western populations centred around Kangaroo Island the adult leaves with mainly stellate hairs predominate but in plants from the South-East they often never develop. At present it cannot be conclusively assessed whether the retention of this juvenile character results from the wetter environment as these plants have usually been recorded from next to marshes or temporarily inundated areas and only a few specimens (e.g. Younghusband Peninsula, L.D. Williams 5445; Lake Bonney, J.B. Cleland AD 96227101) do have adult leaves. Alternatively, this behaviour may be due to a slight local genetic variation, which is expressed in a wetter habitat but sometimes occurs together with some plants of the typical form of the species. The latter seem to apply since the specimen Bates 16314 from 'mallee on limestone' - the common drier habitat in western populations of the species - in Mt Scott Conservation Park shows only juvenile leaves.

The epithet 'pallidiflora', pale-flowered in Latin, refers to the pale yellow petals.

***Hibbertia sessiliflora* Toelken, sp. nov.**

*H. stricta* var. *readeri* Ewart in Ewart & Jean White, Proc. Roy. Soc. Victoria NS 21, 2: 543 (1909).

*Type*: Victoria, Casterton, F.M. Reader s.n., 30.vii.1908 (lecto., selected here: MEL 35752; syn.: MEL 695563, NSW 101987).

A *H. sericea* subsp. *scabrifolia* foliorum laminis ellipticis basibus cuneatis et subtus vena centrale angustissima, ramis glabrescentibus filo metallico similis differt.

*Type*: Victoria, near Dergholm, H.R. Toelken 8358 (holo.: AD; iso.: B, CANB, G, K, MEL, MO, NSW, NY).

Shrublets with erect to decumbent woody stems 0.1–0.5 m long and with spreading puberulous wiry branches with internodes up to 2.3 cm long and reddish-brown becoming greyish. *Tomentum* of tubercle-based stellate hairs under coarse simple hairs soon wearing off on branches and leaves but retained on calyx. *Leaves* with axillary tuft of hairs 1.3–1.7 mm long or about twice as long as petiole at least towards the apex of branches; *petiole* 0.2–0.6 mm long; *lamina* linear-elliptic to rarely -lanceolate or elliptic, (3.6-) 4.5–8 (-9.6) × (1.2-) 1.5–2.3 (-3.2) mm, gradually constricted into blunt apex with tuft of simple hairs and into short petiole, discolorous, above convex and with scattered stellate hairs under simple hairs soon glabrescent, below with narrow to broader recurved to revolute margins well raised above the narrow central vein and stellate-tomentose with scattered longer simple hairs mainly on the central vein. *Flowers* sessile, terminal on mainly short shoots often with only reduced leaves and 3 more densely hairy bracts 1.2–1.5 mm long or up to quarter of the calyx, or on long shoots with similar bracts and reduced leaves. *Sepals* 5.4–6.3 mm long, subequal, acute to pointed, outside densely covered with coarse simple hairs over finer stellate ones, inside glabrous except mainly simple hairs on upper third of outer sepals, reddish-brown to greyish-brown. *Petals* obovate, 3.8–9.6 mm long, mid to bright and deep yellow. *Stamens* 4–8 (-10) in one cluster; *filaments* free or basally connate; *anthers* oblong, usually tapering above and below. *Carpels* 2, woolly, with styles each attached to the dorsal apex. Fig. 2K–M.

#### *Distribution and ecology*

Growing on winter-wet clay flats under scrub vegetation between or rarely under *Eucalyptus* woodland. Restricted to few localities in western Victoria and adjoining South Australia; the conservation status is in urgent need of review.

#### *Voucher specimens*

SOUTH AUSTRALIA: *South-eastern*: P. Gibbons 140 (AD, MO); J.Z. Weber 7323 (AD, CANB). VICTORIA: *Wannon*: F.M. Reader s.n. (MEL, NSW).

#### *Notes*

This species resembles *H. sericea* var. *scabrifolia* in having relatively long coarse simple hairs in the leaf axils and on the sepals as well as usually several reduced leaves at the base of each flower, but should rather be placed close to *H. riparia*, because of its single terminal flower borne usually on short shoots and the absence of hairs between the stamens and the petals. The long coarse simple hairs in the leaf axils and on the calyx distinguish this species from other forms in the *H. riparia* complex. The decumbent habit of *H. sessiliflora* is also unusual although young plants often have erect branches each ending in a single flower.

*H. stricta* var. *readeri* has not been raised to species level as it was never taken up in literature and even Ewart (1931) himself did not refer to it in his Flora of Victoria. The most complete specimen, which also seems to have F.M. Reader's original label attached, was chosen as a lectotype, as it seems that the variety was described based on all the material, and duplicates with the name written on the label were later distributed. The epithet 'sessiliflora', sessile-flowered in Latin, refers to the many flowers along the stem which appear to be sessile as they are borne on very short short shoots.

#### *H. tenuis* Toelken & R. Bates, *sp. nov.*

A *H. riparia* sens. lat. differentiis collectivis distinctur: habitus debilis procumbens, folia breves (4–7 (-12) mm longa) costis centralibus quam marginibus revolutis petiolisque latioribus, pedunculi filiformes et fructus recurvi, 4–6 stamina.

*Type:* South Australia, near Yundi, H.R. Toelken 8329, 14.xii.1991 (holo.: AD; iso.: B, CANB, G, K, MEL, NY).

Shrublets with procumbent to scrambling, puberulous branches to 0.5 m long. *Tomentum* of fine tubercle-based mainly stellate hairs with usually many more or less equal branches spreading in all directions, on branches and calyx while with 1–3 branches on the upper surface of leaves. *Leaves* without axillary tuft of hairs; *petiole* 0.2–0.5 mm long; *lamina* linear, (3.6–) 4.4–7 (-12.2) × 0.7–1.1 (-1.5) mm, obtuse to rounded with abruptly constricted apex of central ridge recurved and scarcely protruding, abruptly constricted into petiole, above convex and puberulous with hairs with 1–3, usually forward-directed branches, below with central ridge much broader than revolute margins and puberulous with much-branched hairs. *Flowers* on filiform peduncle 4–18 mm long and recurved after flowering, terminal on long and short shoots but usually leaf-opposed due to sympodial growth, with linear or linear-lanceolate bracts 1.4–2.8 mm long, usually about one third down from calyx and without recurved margins. *Sepals* 4.1–5.3 mm long, outer narrowly lanceolate and acuminate, inner narrowly oblong and acute to rounded, puberulous with short much-branched stellate hairs, pale green. *Petals* obovate to oblong-obovate, 5.2–7.8 mm long, mid to bright yellow. *Stamens* 4–6 in one cluster; *filaments* free or almost so; *anthers* oblong, truncate. *Carpels* 2, puberulous, recurved with erect styles attached to the dorsal apex. Fig. 2N–P.

#### *Distribution and ecology*

Restricted to low or open vegetation in permanent wet places in the vicinity of Mt Compass where its conservation status is highly vulnerable.

#### *Voucher specimens*

SOUTH AUSTRALIA: *Southern Lofty*: R. Bates 4051, 10.xi.1977 (AD); 655, -4.1980 (AD).

#### *Notes*

A local endemic which superficially resembles *H. australis* N.A. Wakef., but is distinguished by its delicate procumbent habit, short leaves with sparse stellate hairs of 1–3 branches above, relatively broad central ridge and recurved fruiting peduncle. The specific epithet 'tenuis', delicate in Latin, refers to its more delicate and slender habit in comparison to *H. australis*.

*H. tenuis*, like most species of *Hibbertia* growing in permanent moist places, produces flowers the whole year round.

#### ***Hibbertia torulosa* Toelken, sp. nov.**

*H. serpyllifoliae* similis sed staminibus aggregatis praesentiaque pilorum stellatorum differt.

*Type:* Cultivated specimen, E. Clucas s.n., 7.x.1994 (originally from near Bemm River in Victoria)(holo.: MEL; iso.: AD, K).

Shrublets with spreading pubescent knobby branches, up to 0.6 m high, much branched. *Tomentum* of fine tubercle-based hairs usually simple over stellate hairs with up to 4 branches, on branches and leaves as well as the apices of the sepals. *Leaves* with axillary tufts of hairs 0.3–0.6 mm long; *petiole* 0–0.25 mm long; *lamina* linear, 1.9–4.3 (-6.2) × 0.7–1.2 mm, abruptly tapering into blunt apex with tuft of hairs on protruding central ridge, scarcely constricted into short petiole, above convex and puberulous, below with broad revolute margins touching slightly recessed broader central ridge and puberulous, straight, erect. *Flowers* subsessile, terminal on all branches but mainly on short shoots, with linear-

triangular bract 0.8–1.3 mm long and without recurved margins. *Sepals* (3.8–) 4.3–5.4 mm long, outer lanceolate and acuminate or acute, inner ovate and acute to obtuse, pubescent towards the apex, yellowish-green. *Petals* obovate, 4.8–6.2 (-7.6) mm long, mid to bright yellow. *Stamens* 6 in one cluster; *filaments* free; *anthers* oblong, truncate above and below. *Carpels* 2, villose to tomentose, with erect styles from dorsal apex. Fig. 2Q–S.

#### *Distribution and ecology*

The species is known only from the type collection from woodland near Bemm River so that it seems to represent a vulnerable very local taxon.

#### *Notes*

*H. torulosa* is superficially similar to *H. serpyllifolia* and distinguished not only by stamens grouped in one cluster but mainly because this is part of a different pollination syndrome. While the three styles of *H. serpyllifolia* spread laterally away from the erect stamens arranged around the ovary, the two styles of *H. torulosa* curve upwards so that their stigmas are situated above the group of stamens. The latter type of flowers and the presence of distinct stellate hairs especially on the branches indicate a closer relation to some forms of the *H. riparia* complex from Tasmania.

Since the description is based on cultivated material the measurements of various organs might be somewhat larger than in plants collected in the field. The type specimen prepared in spring does not differ significantly from an earlier specimen received in autumn. However, it has straighter branches with less pronounced leaf bases so that the branchlets appear less knobby, *torulosa* in Latin.

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